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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,540	02/09/2004	Ricky Smith	14374.107	3131
22913	7590	04/27/2005	EXAMINER	
WORKMAN NYDEGGER (F/K/A WORKMAN NYDEGGER & SEELEY) 60 EAST SOUTH TEMPLE 1000 EAGLE GATE TOWER SALT LAKE CITY, UT 84111			KIKNADZE, IRAKLI	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 04/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SM

Office Action Summary	Application No.		Applicant(s)	
	10/776,540		SMITH, RICKY	
	Examiner		Art Unit	
	Irakli Kiknadze		2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/13/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show "a single magnetic element (406)" reference to Fig.3 as described in the specification (first introduced on page 13, line 5). Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims ¹/₂, 2, 4, 6-17, 19, 20, 23 and 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Foerst et al. (US Patent 6,111,934).

With respect to claim 1, Foerst teaches a cathode head suitable for use in an x-ray device that includes an anode (2) having a target surface (9) configured and arranged to receive electrons emitted by the cathode head so as to generate x-rays, the cathode head comprising: an emitter block (20); an emitter (1) attached to the emitter block (20) and configured to generate an electron beam that defines a focal spot on the target surface (9) of the anode (2); and at least one magnetic element (31) disposed proximate the emitter (1) (Figs. 1-3; column 3, lines 11-48 and column 4, lines 15-20).

With respect to claim 2, Foerst teaches that at least one magnetic element comprises at least one electromagnet (31) (column 4, lines 15-20).

With respect to claim 4, Foerst teaches that the emitter block comprises non-magnetic insulator (20) (column 3, line 42).

With respect to claim 6, Foerst teaches that the emitter defines a longitudinal axis about which the at least one magnetic element (31) is disposed (Figs. 2 and 3).

With respect to claim 8, Foerst teaches that at least one magnetic element (31) and the emitter block cooperate to create a magnetic field through which at least a portion of the electron beam passes (Figs. 2 and 3).

With respect to claim 9, Foerst teaches that the emitter (1) comprises at least one filament (Fig. 1; column 3, lines 54-64).

With respect to claim 10, Foerst teaches that a cathode head suitable for use in an x-ray device that includes an anode (2) having a target surface (9) configured and arranged to receive electrons emitted by the cathode head, the cathode head comprising: an emitter block (20), an emitter (1) attached to the emitter block and configured to generate an electron beam that defines a focal spot on the target surface (9) of the anode (2); and means (31, 33-38) for facilitating focal spot control (Figs. 1-3; column 3, lines 11-48 and column 4, lines 15-35).

With respect to claim 11, Foerst teaches that the means for facilitating focal spot control serves to adjust the position of the focal spot on the target surface (column 4, lines 21-35).

With respect to claim 12, Foerst teaches that the means for facilitating focal spot control enables at least lateral adjustments to the position of the focal spot on the target surface (9) (column 4, lines 21-35).

With respect to claim 13, Foerst teaches that the means for facilitating focal spot control employs a magnetic field to adjust the position of the focal spot on the target surface (9) (column 4, lines 21-35).

With respect to claim 14, Foerst teaches that the magnetic field is substantially perpendicular to the electron beam (Figs. 1-3).

With respect to claim 15 Foerst teaches that the means for facilitating focal spot control implements an adjustable deflection of the electron beam (column 4, lines 21-35).

With respect to claim 16, Foerst teaches that the means for facilitating focal spot control acts on the electron beam in a location proximate the emitter (1) (Fig.2).

With respect to claim 17, Foerst teaches that the emitter block (20) is substantially non-magnetic (column 3, line 41).

With respect to claim 19, Foerst teaches that the means for facilitating focal spot control cooperates with the emitter block to create a magnetic field through which at least a portion of the electron beam passes (Fig. 2; column 4, lines 14-35).

With respect to claim 20, Foerst teaches that an x-ray device, comprising: a vacuum enclosure (3); an anode (2) substantially disposed within the vacuum enclosure, the anode (2) including a target surface (9); and a cathode head substantially disposed within the vacuum enclosure and comprising: an emitter block (20); an emitter (1) attached to the emitter block (20) and configured to generate an electron beam that defines a focal spot on the target surface (9) of the anode (2); and at least one magnetic

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element (31) disposed proximate the emitter (Figs. 1-3; column 3, lines 11-48 and column 4, lines 15-35).

With respect to claim 23, Foerst teaches that the emitter block (20) is substantially non-magnetic (column 3, line 41).

With respect to claim 25, Foerst teaches that the emitter (1) defines a longitudinal axis about which the at least one magnetic element is disposed (Fig.2).

With respect to claim 26, Foerst teaches that at least one magnetic element and the emitter block cooperate to create a magnetic field through which at least a portion of the electron beam passes (column 4, lines 14-35).

With respect to claim 27, Foerst teaches that the anode (2) is a rotating anode (Fig.1; column 3, lines 12-15).

4. Claims 1, 7, 10, 20, 21, 29, 30 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Foerst et al. (US Patent 6,055,294).

With respect to claims 1, 10, 20 and 29, Foerst teaches a cathode head suitable for use in an x-ray device that includes a vacuum enclosure (3) within which is disposed an anode (2) having a target surface (9) configured and arranged to receive electrons emitted by the cathode head, the cathode head being substantially disposed within the vacuum enclosure and comprising: an emitter block (20); a filament attached to the emitter block (20) and defining a longitudinal axis, the filament being configured to emit an electron beam that defines a focal spot on the target surface (9) of the anode (2); and at least one electromagnet (31a or 31b) attached to the emitter block and disposed

about the longitudinal axis defined by the filament (Figs. 1-3; column 3, lines 31-50 and column 4, lines 18-51).

With respect to claim 30, Foerst teaches that the emitter block (20) is substantially non-magnetic (column 3, line 61).

With respect to claims 7, 21 and 32, Foerst teaches that the at least one electromagnet comprises a pair of electromagnets (31a and 31b) (column 4, lines 25-36).

5. Claims 1-3, 20, 22 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Hell et al. (US Patent 5,548,630).

With respect to claims 1 and 20, Hell teaches a cathode head suitable for use in an x-ray device that includes an anode (4) having a target surface configured and arranged to receive electrons emitted by the cathode head so as to generate x-rays, the cathode head comprising: an emitter block (1); an emitter attached to the emitter block and configured to generate an electron beam that defines a focal spot on the target surface of the anode (4); and at least one magnetic element (5) disposed proximate the emitter (1) (column 2, lines 24-64).

With respect to claim 2, Hell teaches that at least one magnetic element comprises at least one electromagnet (6) (column 3, lines 34-40).

With respect to claims 3 and 22, Hell teaches that at least one magnetic element comprises at least one permanent magnet (5) (column 2, lines 30-35).

With respect to claim 28, Hell teaches that the anode (4) is stationary (Figs 1 and 2; column 2, lines 27-32).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5, 18, 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerst et al. (US Patent 6,055,294) as applied to claim 1, 10, 20 and 29 above, and further in view of Habberrecker (US Patent 4,631,744).

With respect to claims 5, 18, 24 and 31, Foerst teaches claimed invention except that the emitter block is magnetic. Habberrecker teaches an X-ray tube comprising " a cathode head (6) made of ferromagnetic material having a Curie point above 700°C and mounted on a supporting element to the tube envelope via direct metallic connection. The combination of high Curie point and direct metallic connection provide good heat transfer such that the Curie point is not exceeded so that the cathode head always remains ferromagnetic. The cathode head thus always operates in a predictable manner and no movement of the focus by magnetic field occurs " (see abstract; Figs. 2 and 3; column 1, lines 51-62 and column 2, lines 55-68). It would have been obvious to one of ordinary skill in art at the time of the invention was made to employ the cathode head teachings of Habberrecker in the invention of Foerst to provide the X-ray tube with the cathode comprising magnetic emitter block because it would provide a predictable manner operating cathode such as no movement of the focus occurs cause to high

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operating temperature variations and/or some external magnetic field without input of the magnetic element disposed proximate the emitter to achieve a particular effect with respect to controlling the focal spot of the emitted electron beam.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is 571-272-2493. The examiner can normally be reached on 9:00- 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 21, 2005
Irakli Kiknadze

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**EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER**